GYPSUM

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Pure gypsum is a white-to-transparent-colored mineral, but sometimes impurities color it grey, brown, or pink. Its chemical name is calcium sulfate dihydrate, and its chemical formula is $CaSO_4 \cdot 2H_2O$. When gypsum is heated, it loses about three-quarters of its water and becomes hemihydrate gypsum ($CaSO_4 \cdot \frac{1}{2}H_2O$), which is soft and can be easily ground to a powder called hemihydrate gypsum plaster or plaster of paris. If this powder is mixed with water to form a paste or slurry, it will dry and set rock hard. The chemically combined water, previously driven off by heating, will recombine, and the material will revert to the original chemical composition of gypsum. While the hemihydrate gypsum plaster is in slurry form, it can be poured between two paper layers to make wallboard, used to fill cracks and crevices, or poured into a mold. Gypsum makes an ideal building material because it is abundant, economical, fire resistant, strong, and versatile. It also can reduce or control sound, and its use can have environmental benefits.

Gypsum has been known for centuries and is one of the oldest building materials in the world. The earliest known use of gypsum was in Anatolia around 6000 B.C. Later, in about 3700 B.C., gypsum was used on the interiors of the great pyramids in Egypt.

Gypsum is found in every continent of the world and is one of the most widely used minerals. Gypsum mines are located all across North America, and some Western States possess large desert deposits of powdery gypsum rock.

Synthetic gypsum is generated as a byproduct of flue-gas desulfurization (FGD) systems used to reduce sulfur dioxide emissions from coal-fired powerplants. These FGD systems not only keep the air clean, but they also provide a sustainable, ecologically sound source of pure gypsum. Synthetic gypsum also is generated by various other acid-neutralizing industrial processes.

In the United States, most gypsum is used to manufacture wallboard and plaster for homes, offices, and commercial buildings. An average new American home contains more than 7.31 metric tons (t) of gypsum or, in other terms, more than 571 square meters (6,144 square feet) of gypsum wallboard (Mineral Information Institute, 2001). Worldwide, gypsum is used in portland cement, which is used in concrete for highways, bridges, buildings, and many other structures that are part of our everyday life. Gypsum is also extensively used as a soil conditioner on large tracts of land in suburban areas and in agricultural regions.

Production

After a record setting year in 1999, the gypsum industry in the United States reported decreased production in both 2000 and 2001. In 2002, there was a slight production increase compared with 2001. Use of synthetic gypsum as a raw material for wallboard plants increased in 2002.

During 2002, the U.S. gypsum industry experienced several acquisitions, continued bankruptcy reorganization, opening of new plants, closing of older facilities, and expansion of production capacity at existing plants.

On June 25, 2001, USG Corp. and its domestic subsidiaries U.S. Gypsum Co., USG Interiors, Inc., and L&W Supply Corp. filed voluntary petitions for reorganization under Chapter 11 of the U.S. Bankruptcy Code (USG Corp., 2001§[1]). This filing was done to manage the growing costs of asbestos litigation and to fairly resolve asbestos claims. Since 1994, U.S. Gypsum has paid more than $450 million to manage and resolve asbestos-related litigation (Sharpe, 2002). During its restructuring period and later, U.S. Gypsum's operations continued without interruption. U.S. Gypsum's goal was to address its asbestos liability through Chapter 11, to complete its restructuring, and to emerge from Chapter 11 as quickly as possible with a comprehensive and final resolution (USG Corp., 2001§). The bankruptcy court determined that January 15, 2003, was the last day to file claims in the U.S. Gypsum Chapter 11 proceeding (USG Inc., 2002§).

In 2002, U.S. Gypsum opened a new Phoenix, AZ, plant for the manufacturing of joint compounds and textured finishing products. This plant will also warehouse and distribute wallboard and cement board installation and finishing products manufactured at other USG Corp. plants. The Seattle/Tacoma, WA, joint treatment plant and warehouse was permanently closed by USG in 2002. USG added a new cement-board-panel-manufacturing line at its Baltimore, MD, gypsum wallboard plant. Cement board panels are used as backer board for the installation of ceramic tile and exterior finishing systems. National Gypsum Co. announced it would acquire a wallboard paper mill from Georgia-Pacific Gypsum Co. The paper mill is in Delair, NJ, and it can produce 223 million square meters (2.4 billion square feet) of paper used to face and back gypsum wallboard.

In 2002, Lafarge North America closed its Wilmington, DE, gypsum wallboard plant. This plant had produced about 30.2 million square meters (325 million square feet) in 2001. Lafarge will meet customer demand from newer, more efficient plants in the Eastern United States. Lafarge acquired Continental Gypsum's Newark, NJ, wallboard plant in 2002. This plant has wallboard production capacity of more than 27.9 million square meters per year (300 million square feet per year). Georgia-Pacific opened a new industrial-

[1]References that include a section mark (§) are found in the Internet References Cited section.

plaster-manufacturing plant in Las Vegas, NV, during the first quarter of 2002. This plant produces gypsum plaster products, industrial fillers, and agricultural gypsum for the Western United States.

In 2002, British Plasterboard, plc (BPB) introduced a new structure for its North American operations. BPB now includes BPB Celotex, BPB Marco, BPB Westroc, and BPB Gypsum. BPB now has 31 operations in the United States and Canada, and it has a 16% share of the North American wallboard products market. Early in 2002, BPB acquired James Hardie Gypsum and Western Mining and Minerals for $345 million. The three James Hardie Gypsum plants are in Nashville, AR, Las Vegas, NV, and Seattle, WA, and their combined production is about 204 million square meters per year (2.2 billion square feet per year) of wallboard. The quarry and plant at the Blue Diamond site southwest of Las Vegas, NV, will close within the next 3 years (Sharpe, 2003).

Gypsum industry data for this report are collected by the U.S. Geological Survey (USGS) from semiannual and annual surveys of gypsum operations and from monthly statistics provided by the Gypsum Association in Washington, DC. The 2002 USGS survey, which canvassed 111 gypsum production operations that accounted for almost all domestic output, had a response rate of approximately 96%. The output of producers who did not respond to the survey was estimated from their survey responses in previous years or from other sources familiar with the gypsum industry.

The United States continued to lead the world in gypsum production in 2002, accounting for 15.4% of reported global output. During 2002, domestic output of crude gypsum decreased by 3.9% from that of 2001 to about 15.7 million metric tons (Mt) valued at $108 million (table 1).

Crude gypsum was mined by 25 companies in the United States at 50 mines in 17 States. More than 75% of the gypsum was mined by 6 companies at 30 mines. The top producing States, in descending order, were Oklahoma, Texas, Nevada, Iowa, California, Michigan, and Indiana. These 7 States, with 30 mines, each produced more than 1 Mt and together accounted for 78% of total domestic output (table 2).

The U.S. gypsum industry consisted primarily of a few large, vertically integrated companies that mined gypsum and manufactured wallboard, plaster, and other gypsum products. Companies with the most mines were U.S. Gypsum with nine; National Gypsum, seven; Georgia-Pacific, seven; BPB Celotex, four; and Harrison Gypsum Inc., three. These companies produced almost 70% of the total U.S. crude gypsum. The 10 largest gypsum mines in the United States accounted for almost 50% of domestic output in 2002. These mines were owned by 6 companies, and the average output of the 10 mines was 773,000 t.

During 2002, gypsum was calcined (partially dehydrated by heating) at 61 plants operated by 8 companies in 29 States, principally to produce feedstock for wallboard and plaster plants. The leading States, in descending order, were California, Iowa, Florida, Texas, Indiana, and Arkansas. These 6 States, with 24 plants, each produced more than 1.0 Mt of calcined gypsum and together accounted for more than 47% of national output (table 3). In 2002, domestic output of calcined gypsum decreased by 2.8% from that of 2001 to 18.6 Mt valued at $372 million.

Companies with the most calcining plants were U.S. Gypsum with 21; National Gypsum, 18; Georgia-Pacific, 12; and BPB Celotex, 5. These companies produced nearly 89% of the national calcined gypsum output. The 10 largest calcining plants in the United States accounted for more than 31% of production in 2002. These plants were owned by six companies, and the average output of the plants was 577,000 t.

In addition to mined gypsum production, synthetic gypsum was generated as a byproduct of various industrial processes. The primary source of synthetic gypsum was FGD at coal-fired electric powerplants. Smaller amounts of synthetic gypsum were derived as a byproduct of chemical processes, such as acid neutralization processes, citric acid production, sugar production from sugar beets, and titanium dioxide production. Synthetic gypsum was used as a substitute for mined gypsum, principally for wallboard manufacturing, agricultural purposes, and cement production. In response to USGS surveys, nine companies operating in eight States reported that more than 2.13 Mt of synthetic gypsum generated by industrial processes at their mines and plants was sold or used for such applications in 2002. In addition to these companies, about 80 domestic coal-fired electric utilities generated approximately 11.4 Mt of synthetic gypsum from their FGD systems during 2002. About 7.77 Mt or 68% of all synthetic gypsum generated by domestic coal-fired electric utility FGD systems was used in 2002 compared with 27% in 2001. Of this 7.77 Mt of synthetic gypsum used during the year, 7.25 Mt was used for wallboard production, 364,000 t was used in cement and concrete manufacture, and 77,700 t was used for agricultural purposes (American Coal Ash Association, written commun., 2003). Phosphogypsum is another industrial byproduct derived from manufacturing fertilizer. At present, phosphogypsum is not used in wallboard manufacturing because of the presence of radionucleides, which decay and have radon, a radioactive gas, as a daughter product.

During 2002, 9 companies manufactured gypsum wallboard at 79 plants in the United States. Plant production capacity was expanded by 4.9% to 3.59 billion square meters per year (38.6 billion square feet per year) by yearend. Wallboard shipments in 2002 increased by 1.8% from those of 2001 to approximately 2.78 billion square meters (29.9 billion square feet). This represents only 77% of the total production capacity (Gypsum Association, 2002, 2003).

During 2002, several new wallboard and plaster plants became operational, providing additional production capacity and replacing older, less efficient manufacturing facilities. Most of the new wallboard plant capacity constructed in the United States during the past few years depended entirely on synthetic gypsum generated by FGD systems as the raw material. The FGD systems operated by electric utilities generated high-quality, low-cost synthetic gypsum. Some gypsum companies have expanded or will be expanding synthetic gypsum use at existing wallboard plants, as well. At least a dozen wallboard plants in the United States already are using some synthetic gypsum to augment their feedstock from gypsum mines (Sharpe, 2002, 2003).

A portion of the gypsum waste generated every year by wallboard manufacturing, wallboard installation, and building demolition was recycled. Gypsum waste generated by the wallboard manufacturing process can be recycled easily. The gypsum core and paper are disaggregated and fed back into the raw material stream along with new material. New construction and renovation results in the generation of 10% to 12% of wallboard scrap. The costs of the disposal of this wallboard scrap in solid waste landfills are increasing.

Wallboard scrap from new construction may be ground and used as a soil conditioner, and in some cases, wallboard scrap from new construction may be returned to a plant for recycling (Sharpe, 2003). Other potential markets for recycled gypsum waste are in cement production, as a stucco additive, in sludge drying, in water treatment, in grease absorption, and for marking athletic fields (Turley, 1998; California Integrated Waste Management Board, 2000§). New West Gypsum Recycling, a Canadian company, has developed proprietary technology for recycling scrap wallboard. New West receives scrap wallboard from wallboard manufacturing plants and construction sites and produces about 70,000 metric tons per year (t/yr) of recycled gypsum that is used to make wallboard products (Sharpe, 2003).

Consumption

Apparent domestic consumption (defined as mine output plus reported synthetic gypsum used plus imports minus exports plus adjustments for industry stock changes) was nearly 33.2 Mt in 2002. This was about a 6.8% increase in U.S. gypsum consumption compared with that of 2001. Domestic sources (mining plus an estimated 9.9 Mt of synthetic gypsum) met more than 77% of domestic consumption requirements; imports satisfied the remaining needs. In 2002, nearly 30% of the gypsum consumed in the United States came from synthetic sources compared with about 22% in 2001.

Gypsum output is categorized as either calcined or uncalcined (table 4). Calcined gypsum was produced domestically from crude gypsum to manufacture wallboard and plaster products. Uncalcined gypsum, used for portland cement production and agriculture, accounted for virtually all remaining consumption during the year.

In 2002, nearly 42% of the calcined gypsum used to manufacture wallboard was consumed in the production of regular ½-inch wallboard. Fire-resistant wallboard, mobile-home board, water- and moisture-resistant board, lath, veneer base, and sheathing composed most of the balance (table 5). Metropolitan areas in the South Atlantic, East North Central, Pacific, and West South Central regions (in decreasing order) were the leading sales areas for gypsum wallboard products.

During 2002, almost 73% of the uncalcined gypsum consumed in the United States was for portland cement production; the remainder was used primarily in agriculture. Gypsum, which is added to cement to retard its setting time, accounted for about 2% to 5% by weight of cement output (Dutton, 1997). Finely ground gypsum rock was used in agriculture and other industries to neutralize sodic soils, to improve soil permeability, to add nutrients, to stabilize slopes, and to provide catalytic support for maximum fertilizer benefits. Small amounts of high-purity gypsum also were used in a wide range of industrial operations, including the production of foods, glass, paper, and pharmaceuticals.

Prices

In 2002, the average values (free on board, mine or plant) reported by U.S. producers were $6.90 per metric ton for crude gypsum and about $20.00 per ton for calcined gypsum. The average value for plaster reported by domestic producers during the year was $15.13 per 100 kilograms ($6.86 per 100 pounds). In 2002, the average value of uncalcined gypsum used in agriculture and in cement production was about $15.50 per ton.

During 2002, prices for gypsum wallboard generally increased in response to increased demand. Prices for regular ½-inch wallboard dropped in 7 of the 20 major U.S. metropolitan areas that were sampled, remained the same in 3 of the 20, and increased in 10 of the 20. During 2002, the changes in prices for each metropolitan area ranged from a decrease of $94 per 100 square meters ($87 per 1,000 square feet) to an increase of $45 per 100 square meters ($42 per 1,000 square feet). Prices in these 20 U.S. cities ranged from $138 to $301 per 100 square meters ($128 to $280 per 1,000 square feet) at yearend. The average of the prices in these 20 U.S. cities was $211 per 100 square meters ($196 per 1,000 square feet) in January and $215 per 100 square meters ($200 per 1,000 square feet) at yearend (Engineering News-Record, 2002a, b).

Foreign Trade

In 2002, the United States was the world leader in the international trade of gypsum and gypsum products. The Nation imported crude gypsum from 9 countries (table 6) and exported gypsum wallboard to 69 countries and territories. U.S. imports accounted for most of the world's waterborne shipment of crude gypsum (Phillips, 1998). Only a small amount of crude gypsum was exported by the United States (table 7).

Net imports of crude gypsum in 2002, which decreased by 3.6% from those of 2001, accounted for 24% of apparent consumption. Much of this import dependence can be attributed to the lack of adequate domestic gypsum resources near large east coast wallboard markets. These imports came primarily from Canada and Mexico. The two countries primarily supplied wallboard plants in coastal markets; most imports from Canada went to east coast plants, and Mexican sources chiefly served the west coast. Foreign subsidiaries of U.S. gypsum companies produced much of the gypsum that was imported for the wallboard plants. Smaller amounts of imported gypsum were used in portland cement production.

Wallboard exports, totaling about 6.75 million square meters (72.6 million square feet) and valued at $33.7 million, went primarily to countries and territories in Asia, Europe, and Latin America. Wallboard imports were about 52.1 million square meters (560 million square feet) valued at $55.8 million.

World Review

In 2002, 90 countries produced gypsum, 8 of which accounted for nearly 63% of the total world production (table 8). Global gypsum production in 2002 is estimated to be more than 101 Mt. More than 110 million metric tons per year of synthetic gypsum is generated worldwide (Roskill Information Services Ltd., 2000). The high demand for gypsum in the United States by the domestic construction industry was not matched abroad, with the exception of Canada and Mexico, which export to U.S. markets. The estimate for world production is probably lower than actual production because output that is used by gypsum producers in some countries to make other products onsite was not reported. Additionally, production from small deposits in developing nations was intermittent and in many cases unreported.

As a low-value, high-bulk commodity drawn from deposits widely distributed throughout the world, gypsum tended to be consumed within the many countries that mine it. Less than 20% of the world's crude gypsum production was estimated to enter international trade. Only a few countries, such as Canada, Mexico, Spain, and Thailand, were major crude gypsum exporters; and of these, Canada and Mexico are significant gypsum exporters because of their proximity to large U.S. wallboard markets.

Although use of gypsum wallboard increased worldwide, only industrialized nations, such as the United States, used gypsum primarily for wallboard products. In developing countries, especially in the Middle East and Asia, most gypsum was used in the production of cement or as a plaster product.

Estimated world production capacity for gypsum wallboard in 2002 exceeded 5.6 billion square meters per year (about 60 billion square feet per year) at more than 250 plants worldwide. Almost one-half of this capacity was in the United States, and Asia and Western Europe each accounted for about one-fifth. Construction or expansion of dozens of wallboard plants was underway during the year in many countries, and as in the United States, the use of synthetic gypsum by other industrialized nations increased.

Europe.—In the fourth quarter of 2002, BPB announced it would acquire control of Gyproc Benelux in Europe. This transaction was completed in early 2003. The acquisition of the plasterboard and plaster business of Etex in Belgium and the Netherlands increased BPB's equity share in Gyproc to 99% from 46%. The net acquisition cost was $54.9 million, and BPB assumed a $24.8 million debt obligation. BPB increased its presence in the Eastern European market by acquiring the second largest plaster producer in Turkey. Plaster production volumes in Eastern Europe increased by 50% in 2002. A new wallboard- and building-plaster-manufacturing operation was commissioned at Termoli, Italy, during the second quarter of 2002. This new plant will provide more wallboard capacity for a market that has grown at a rate exceeding 10% per year during the past 5 years. The plaster operation will afford opportunities for exporting to other markets in the Balkans and the Mediterranean Sea region (Sharpe, 2003).

Brazil.—Knauf Group invested $1.5 million during the late 1990s in developing an open pit mine near Camamu in Bahia, Brazil. The Camamu gypsum deposit is believed to be the largest in Brazil, with estimated reserves of at least 50 Mt of gypsum. The capacity of the operation is 150,000 t/yr. Knauf do Brasil had previously completed construction of a 12-million-square-meter-capacity gypsum wallboard plant in Rio de Janeiro State in 2000. Early in 2003, Knauf announced plans to invest $5.7 million to develop an underground mining project in the Camamu deposit. This underground mine will be an extension of the open pit mine and will produce 200,000 to 300,000 t/yr. The Brazilian consortium Consorcio de Exportacones do Gesso de Permanbuco entered into a contract to export 177,000 t/yr of gypsum to the United States (Sharpe, 2003).

Egypt.—In 2002, Lafarge was building a wallboard plant near Al-Ubur, Egypt. The plant will become operational in the second half of 2003. Lafarge also has acquired wallboard operations of Gyproc in Germany and Poland from BPB (Sharpe, 2003).

Malaysia.—Boral Plasterboard Malaysia Sdn Bhd planned to build a new wallboard plant in the State of Johore in Malaysia (Sharpe, 2003).

Outlook

One of the key indicators used by the wallboard and gypsum industry is the number of new housing starts. Although housing starts in North America and Europe have been fairly robust, this has been countered by a very poor commercial construction market (Industrial Minerals, 2003). U.S. production and consumption data for 2002 and the first part of 2003 suggests that levels in 2003 may rise slightly or at least match the levels of 2002. Other supply-and-demand indicators, such as construction rates for new office and commercial buildings and the continuing trend to construct larger homes with more rooms, also evidence that the gypsum industry will be close to the same level as in 2002.

Implementation of the Transportation Equity Act for the 21st Century (Public Law 105-178, enacted June 9, 1998) for road building and repair through 2003 has been an important stimulus for the domestic cement industry and for the use of gypsum in cement. This Act mandated the repair and replacement of bridges, roads, and other components in the transportation infrastructure. The Safe, Accountable, Flexible, and Efficient Transportation Equity Act of 2003 (S. 1072, H.R. 2088), which is expected to be enacted in early 2004, will continue this funding for the building and repair of the Nation's highway system (U.S. Senate, 2003§).

During the next several years, the use of mined gypsum may decline significantly in the United States as greater quantities of synthetic gypsum are used in wallboard manufacturing. Some actual and planned mine closings already have been attributed to substitution by synthetic gypsum (Gersten, 1999). This rate of substitution seems likely to accelerate additional mine closings during the rest of this decade. The production expansion of synthetic gypsum is set to continue in Europe and North America, but it is limited by the diminishing number of coal-fired electric powerplants without FGD systems. Most powerplants built in recent years were natural-gas-fired.

The domestic gypsum industry is poised for a major change on the supply side. The appearance of very-large-capacity wallboard plants will trigger a major supply shift. As the U.S. gypsum industry undergoes this change towards large-capacity wallboard plants supplied with synthetic gypsum, older, less-efficient, and smaller natural-gypsum-fed plants are expected to find it increasingly difficult to compete (Harris, 2001).

As a response to increased public awareness, the gypsum industry probably will increase its recycling of scrap materials into raw materials streams. There also will be an increase in the use of ecolabels, such as the Scientific Certification System Green Cross, which certifies there is recycled and recovered content in each product.

Industry trends also indicate significant developments abroad in the coming decade. For example, the pace and magnitude of wallboard plant construction in China indicates that China, with more than a billion potential consumers, could become one of the world's leading gypsum wallboard markets. Elsewhere, the extent of wallboard capacity growth in Asia, Central America, Europe, and South America reveals that wallboard manufacturing is likely to become a significant market for gypsum worldwide.

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TABLE 1
SALIENT GYPSUM STATISTICS[1]

(Thousand metric tons and thousand dollars)

	1998	1999	2000	2001	2002
United States:					
Crude:					
Mined	19,000	22,400	19,500	16,300	15,700
Value:	$132,000	$157,000	$165,000	$119,000	$108,000
Imports for consumption	8,680	9,340	9,210	8,270	7,970
Synthetic gypsum sales	3,000	5,200	4,950	6,820	9,900
Calcined:					
Produced	19,400	22,300	21,000	19,100	18,600
Value	$330,000	$381,000	$353,000	$352,000	$372,000
Products sold, value	$3,150,000	$3,540,000	$2,860,000	$2,470,000	$2,690,000
Exports, value	$96,300	$93,300	$102,000	$96,400	$102,000
Imports for consumption, value	$262,000	$465,000	$269,000	$231,000	$196,000
World, production	104,000	109,000	106,000 [r]	102,000 [r]	101,000 [e]

[e]Estimated. [r]Revised.
[1]Data are rounded to no more three significant digits.

TABLE 2
CRUDE GYPSUM MINED IN THE UNITED STATES, BY STATE[1]

State	2001 Active mines	2001 Quantity (thousand metric tons)	2001 Value (thousands)	2002 Active mines	2002 Quantity (thousand metric tons)	2002 Value (thousands)
Arizona and New Mexico	5	872	$5,960	4	459	$3,350
Arkansas, Kansas, Louisiana	4	1,980	20,600	4	1,490	15,900
California, Nevada, Utah	13	3,680	17,200	13	3,910	17,300
Colorado, South Dakota, Wyoming	5	1,030	7,750	5	1,030	8,410
Indiana, New York, Ohio, Virginia	4	1,580	11,100	3	1,240	7,460
Iowa	5	1,870	14,000	6	1,920	13,000
Michigan	3	929	10,600	3	1,020	10,800
Oklahoma	6	2,630	21,300	6	2,520	18,500
Texas	6	1,730	10,500	6	2,060	13,400
Total	51	16,300	119,000	50	15,700	108,000

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 3
CALCINED GYPSUM PRODUCED IN THE UNITED STATES, BY STATE[1]

State	2001			2002		
	Active mines	Quantity (thousand metric tons)	Value (thousands)	Active mines	Quantity (thousand metric tons)	Value (thousands)
Alabama	1	488	$11,600	1	507	$11,500
Arizona, Colorado, New Mexico, Utah	6	1,750	15,800	4	1,070	13,600
Arkansas, Louisiana, Oklahoma	6	2,620	39,600	6	2,220	40,500
California	6	1,790	35,500	6	1,980	35,900
Maryland, North Carolina, Virginia	4	1,210	29,200	4	1,110	28,000
Florida	3	1,360	35,000	3	1,570	41,900
Georgia	1	250	6,340	1	190	4,810
Illinois, Indiana, Kansas	6	1,760	31,600	6	1,890	33,700
Iowa	5	1,490	26,000	5	1,750	30,800
Massachusetts, New Hampshire, New Jersey	5	1,210	29,000	5	1,210	29,500
Michigan	3	392	13,200	3	463	13,700
Nevada	4	1,240	7,350	2	625	5,090
New York	3	672	16,900	2	649	15,900
Ohio	3	286	6,270	3	394	9,140
Oregon	--	--	--	1	371	10,600
Pennsylvania	1	490	9,830	1	534	9,450
Texas	5	1,410	23,400	5	1,330	21,200
Washington and Wyoming	4	727	15,800	3	718	16,700
Total	66	19,100	352,000	61	18,600	372,000

-- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 4
GYPSUM PRODUCTS (MADE FROM DOMESTIC, IMPORTED, AND SYNTHETIC GYPSUM) SOLD OR USED IN THE UNITED STATES, BY USES[1]

(Thousand metric tons and thousand dollars)

	2001		2002	
Use	Quantity	Value	Quantity	Value
Uncalcined:				
Portland cement	2,690	34,400	2,620	32,400
Agriculture and miscellaneous[2]	844	22,000	985	23,300
Total	3,530	56,400	3,600	55,700
Calcined:				
Plasters	1,390	167,000	967	146,000
Prefabricated products[3]	24,300	2,250,000	28,500	2,480,000
Total calcined	25,700	2,410,000	29,500	2,630,000
Grand total	29,200	2,470,000	33,100	2,690,000

[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Includes synthetic gypsum.
[3]Includes weight of paper, metal, or other materials and some synthetic gypsum.

TABLE 5

PREFABRICATED GYPSUM PRODUCTS SOLD OR USED IN THE UNITED STATES[1]

Product	2001			2002		
	Quantity (thousand square feet)	Quantity (thousand metric tons)[2]	Value (thousands)	Quantity (thousand square feet)	Quantity (thousand metric tons)[2]	Value (thousands)
Lath:						
3/8 inch	1,130	(3)	286	854	(3)	241
1/2 inch	(3)	(3)	(3)	(3)	(3)	(3)
Other	(3)	(3)	(3)	(3)	(3)	(3)
Total	1,130	(3)	286	854	(3)	241
Veneer base	472,000	471	$45,400	499,000	502	$53,600
Sheathing	252,000	218	26,800	237,000	235	28,600
Regular gypsumboard:						
3/8 inch	1,630,000	1,440	117,000	2,360,000	2,290	139,000
1/2 inch	13,300,000	9,690	908,000	12,400,000	11,100	1,040,000
5/8 inch	1,820,000	1,930	117,000 r	1,710,000	1,850	97,000
1 inch	201,000	223	46,200	498,000	555	54,900
Other[4]	569,000	485	57,200	1,270,000	1,350	87,500
Total	17,500,000	13,800	1,250,000	18,200,000	17,100	1,420,000
Type X gypsumboard	8,620,000	7,840	625,000	8,090,000	7,860	676,000
Predecorated wallboard	153,000	158	31,200	174,000	180	34,200
5/16-inch mobile home board	909,000	650	99,900	546,000	493	63,300
Water- and moisture-resistant board	1,190,000	928	117,000	1,760,000	1,780	151,000
Other	337,000	224	54,800	317,000	303	58,100
Grand total	29,500,000	24,300	2,250,000	29,900,000	28,500	2,480,000

rRevised.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Includes weight of paper, metal, or other materials.

[3]Less than 1/2 unit.

[4]Includes 1/4-, 7/16-, and 3/4-inch gypsumboard.

TABLE 6
IMPORTS FOR CONSUMPTION OF CRUDE GYPSUM, BY COUNTRY[1]

(Thousand metric tons and thousand dollars)

Country	2001		2002	
	Quantity	Value	Quantity	Value
Canada[2]	5,610	53,900	5,240	43,400
China	(3)	2	--	--
Cyprus	9	482	--	--
Italy	--	--	--	--
Germany	(3)	8	10	35
Japan	(3)	18	(3)	12
Korea, Republic of	--	--	(3)	151
Mexico	1,780	14,500	1,920	16,700
Morocco	(3)	2	(3)	3
Spain	787	7,120	722	7,320
Thailand	74	1,060	80	1,260
United Kingdom	(3)	118	(3)	84
Total	8,270	77,300	7,970	69,000

-- Zero.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Includes anhydrite.
[3]Less than 1/2 unit.

Source: U.S. Census Bureau.

TABLE 7

SUMMATION OF U.S. GYPSUM AND GYPSUM PRODUCTS TRADE DATA[1]

(Thousand metric tons and thousand dollars)

Year	Crude[2]		Plasters[3]		Boards[4]		Other, value[5]	Total, value
	Quantity	Value	Quantity	Value	Quantity	Value		
Exports:								
2001	295	12,900	260	38,200	61	24,800	20,400	96,400
2002	341	16,500	186	31,400	61	33,700	20,200	102,000
Imports for consumption:								
2001	8,270	77,300	9	4,150	516	85,700	63,800	231,000
2002	7,970	69,000	11	4,740	471	55,800	66,200	196,000

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Import and export data are for "Gypsum, anhydrite," Harmonized Tariff Schedule of the United States code 2520.10.0000.

[3]Import and export data are for "Plasters," Harmonized Tariff Schedule of the United States code 2520.20.0000.

[4]Import and export data are for "Boards, sheets, panels, tiles, and similar articles, not ornamented--Faced or reinforced with paper or paperboard only," Harmonized Tariff Schedule of the United States code 6809.11.0000

[5]Import and export data are for "Boards, sheets, panels, tiles, and similar articles, not ornamented: Other," Harmonized Tariff Schedule of the United States code 6809.1900.00 and "Other articles," Harmonized Tariff Schedule of the United States code 6809.90.0000.

Source: U.S. Census Bureau.

TABLE 8
GYPSUM: WORLD PRODUCTION, BY COUNTRY[1, 2]

(Thousand metric tons)

Country	1998	1999	2000	2001	2002[e]
Afghanistan[e]	3	3	3	3	3
Algeria	275 [e]	1,316	1,341	868 [r]	322 [3]
Argentina	650	647	514 [e]	524 [r]	445 [p]
Australia[e]	1,900	2,500	3,800	3,800	4,000
Austria[e, 4]	1,000	1,000	1,000	1,000	1,000
Azerbaijan[e]	60	60	60	60	60
Bhutan[e]	53 [3]	54	54	55	55
Bosnia and Herzegovina[e]	30	30	30	30	30
Brazil[4]	1,632	1,528 [r]	1,498 [r]	1,507 [r]	1,510
Bulgaria[4]	184	169	170	170 [e]	170
Burma	36	45	48	65 [r]	66
Canada[4]	8,967	9,345	9,232	7,821 [r]	8,847 [p]
Chile	781	886	376	517 [r]	500
China[e]	6,800	6,700	6,800	6,800	6,850
Colombia[e]	560	560	560	560	560
Croatia	108 [r]	138 [r]	151	131 [r]	135
Cuba[e]	130	130	130	130	130
Cyprus	297	182	260 [r]	250 [r]	260
Czech Republic	222	136	82	82	80
Dominican Republic	80	81 [r]	110	176	18
Ecuador	2 [e]	1	1	1	1
Egypt[e, 4]	1,338 [3]	2,000	2,000	2,000	2,000
El Salvador[e]	6	6	6	6	6
Eritrea	(5)	1	(5)	(5)	(5)
Ethiopia[4]	120	36	47	51	51
France[e, 4]	4,500	4,500	4,500	4,500	3,500
Germany, marketable[e, 4]	3,000	2,500	2,500	2,500	2,500
Greece[e, 4]	600	600	600	600	500
Guatemala	52	110	212	100 [e]	100
Honduras	30 [e]	56 [r]	59 [r]	60 [r]	59
Hungary[e, 4]	185	203	251	250	250
India[e]	2,192 [3]	2,200	2,210	2,250	2,300
Indonesia	(5)	6	5	6	6
Iran	11,843	10,834	11,000 [e]	11,000 [e]	11,500
Iraq[e]	100	100	80	100	80
Ireland	450	450	450 [e]	450 [e]	450
Israel	56	140	130	133 [e]	131
Italy[e]	1,300	1,300	1,300	1,300	1,300
Jamaica	154	236	330	330	330
Japan	5,305	5,549	5,917	5,874 [r]	5,900
Jordan	176	245	158	163 [e]	176
Kenya[4]	11 [e]	10 [e]	8	8 [r]	8
Laos	130	135	132 [r]	108 [r]	130
Latvia	119	97	122	125 [e]	120
Lebanon[e]	2	2	2	2 [r]	2
Libya[e]	150	150	175	150	150
Luxembourg[e, 4]	(5)	(5)	(5)	(5)	(5)
Macedonia[e]	30	30	30	30	30
Mali[e]	1	1	1	1	1
Mauritania[e]	100 [3]	100	100	100	100
Mexico[4]	7,045	6,954	5,654 [r]	6,237 [r]	6,500
Moldova	20	19	32	32 [e]	32
Mongolia[e]	25	25	25	25	25
Morocco[e]	450	450	450	450	400
Namibia	3 [3]	1	1	1	1
Nicaragua[4]	23	27	28	28 [e]	28
Niger	2 [e]	2	1	2 [e]	2
Nigeria[e]	300	200	200	200	200
Oman	190	180	132	30	60
Pakistan	244 [3]	245	377	350 [e]	360

See footnotes at end of table.

TABLE 8--Continued
GYPSUM: WORLD PRODUCTION, BY COUNTRY[1, 2]

(Thousand metric tons)

Country	1998	1999	2000	2001	2002[e]
Paraguay[e]	5	4	4	4 [3]	4
Peru	79	76	52	41 [r]	30
Poland[4]	1,703	2,023	1,283 [r]	1,096 [r]	1,100
Portugal[e, 4]	500	500	500	500	500
Romania	75	75	75 [e]	75 [e]	75
Russia	609	650	700 [e]	700 [e]	700
Saudi Arabia[e]	330	380 [6]	400	450 [r]	450
Serbia and Montenegro	28	34	47	50	50
Sierra Leone[e]	(5)	(5)	(5)	(5)	4
Slovakia[4]	128	117	124	125 [e]	125
Slovenia[e]	10	10	10	10	10
Somalia[e]	2	2	2	2	2
South Africa	488	505	413	383	415
Spain[e, 4]	8,000	7,500	7,500	7,500	7,500
Sudan[e, 4]	3	4	4	4	4
Switzerland[e]	300	300	300	300	250
Syria	325	394	333	345	345
Taiwan	2	2	2	1 [e]	-- [3]
Tajikistan[e]	32	35	35	35	35
Tanzania[4]	59 [r]	21 [r]	60	72 [r]	72
Thailand	4,334	5,005	5,830	6,533 [r]	6,331 [3]
Tunisia[e]	100	110 [r]	125 [r]	125 [r]	125
Turkey	352	243	303	300 [e]	300
Turkmenistan[e]	100	100	100	100	100
Uganda	2 [e]	(5)	--	--	--
United Arab Emirates[e]	90	90	90	90	90
United Kingdom[e, 4]	2,000	1,800	1,500	1,500	1,500
United States[7]	19,000	22,400	19,500	16,300	15,700 [3]
Uruguay	1,123	1,050	1,076 [r]	1,127 [r]	1,130
Venezuela	80	42	25	5 [r]	10
Yemen	102	103	100 [e]	100 [e]	100
Zambia[e]	11	11	10	10	10
Total	104,000	109,000	106,000 [r]	102,000 [r]	101,000

[e]Estimated. [p]Preliminary. [r]Revised. -- Zero.

[1]World totals, U.S. data, and estimated data are rounded to no more than three significant digits; may not add to totals shown.

[2]Table includes data available through July 15, 2003.

[3]Reported figure.

[4]Includes anhydrite.

[5]Less than 1/2 unit.

[6]Data are for years beginning March 21 of that stated.

[7]Excludes byproduct gypsum.